

WHAT IS CLAIMED IS:

1. In a fractionator having a fractionation vessel, a reactor effluent vapors inlet, a vapor feed contacting zone, a baffled contacting section above said vapor feed contacting zone, a tops section above said baffled contacting section, a heavy bottoms liquid hold-up pool section below said vapor feed contacting zone, a bottoms outlet, a bottoms recycle system with a heat exchanger to recycle, cooled bottoms back to said fractionation vessel at said heavy bottoms liquid hold-up pool section TO enhance operating stability and to reduce coking of the fractionator baffled contacting section and above said vapor feed contacting zone, the improvement which comprises:

Providing in a location separate from said fractionation vessel, a remotely located bottoms liquid hold-up pool vessel for eliminating significant bottoms liquid hold-up within said fractionation vessel to separate cooler liquid from hot vapors, said bottoms liquid hold-up pool vessel being connected to said fractionation vessel via fractionator bottoms liquid outlet.

2. The fractionator of claim 1 wherein said fractionation vessel includes a bottoms liquid removal area which contains walls which are tapered downwardly in a direction toward said bottoms liquid outlet to reduce residence time of the hot liquid in said bottoms liquid removal area.

3. The fractionator of claim 1 wherein said bottoms liquid outlet is also a vapor sealing means created by control of bottoms liquid flow therethrough, thereby, capable of preventing vapor from said fractionation vessel from entering said remotely located liquid hold-up vessel.

4. The fractionator of claim 2 wherein said bottoms liquid removal area includes a small pool holding area which is established at a lower end of said walls and above said bottom liquid outlet, and has a cross-section equal to less than half the cross-section of said fractionation vessel.

5. The fractionator of claim 2 wherein said

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Table 1. Demographic characteristics of the study population	
Age (years)	50.0 ± 10.0
Gender	
Male	50.0%
Female	50.0%
Education (years)	12.0 ± 2.0
Marital status	
Married	80.0%
Single	20.0%
Occupation	
Professional	30.0%
Managerial	20.0%
Technical	10.0%
Skilled	20.0%
Unskilled	20.0%
Income (USD/month)	1,000.0 ± 500.0
Health status	
Good	70.0%
Fair	20.0%
Poor	10.0%

- 40 -

bottoms recycle system includes temperature sensing means located within said bottoms small liquid hold-up pool.

9. The fractionator of claim 5 which further includes temperature control of liquid entering said quenching liquid distributor.
10. The fractionator of claim 1 wherein said heat exchanger is located in a liquid flow path between said fractionation vessel and said bottoms liquid hold-up pool vessel.
11. The fractionator of claim 1 wherein said fractionator is a petro-chemical fractionator.

12. The fractionator of claim 1 wherein said fractionator is a chemical fractionator.

13. In a fractionation process utilizing a fractionation vessel for separation of components having different boiling points, wherein reactor effluent component vapors are fed into a vapor feed contacting zone, wherein low boiling point components separate and pass upwardly above said vapor feed contacting zone, and wherein high boiling point components separate and gravitate into a heavy bottoms liquid hold-up pool section below said vapor feed contacting zone and are removed therefrom via a bottoms outlet, which process also includes utilizing a bottoms recycle system

with a heat exchanger to recycle, cooled bottoms back to said fractionation vessel at said heavy bottoms liquid hold-up pool section and (hold-up is essential for operating stability and avoiding severe coking of the fractionator baffled contacting section) to enhance operating stability and to reduce coking of the fractionator baffled contacting section above said vapor feed contacting zone, the improvement which comprises: preventing condensation and absorption of valuable product vapors by cooler heavy bottoms liquids by providing thermal isolation between said vapor feed contacting zone and said pool section by including within said fractionation process a remotely

located bottoms liquid hold-up pool vessel connected via a bottoms liquid outlet at a separate location from product vapors to thereby separate heavy bottoms liquid within said fractionation vessel; and, providing a bottoms liquid removal area with vapor sealing means at the bottom of said fractionation vessel.

14. The process of claim 13 wherein said bottoms liquid removal area includes walls which are tapered downwardly in a direction toward said bottoms liquid outlet, so as to direct downwardly flowing liquid to said bottoms liquid outlet and minimize residence time of hot bottoms liquid.

15. The process of claim 13 wherein said bottoms liquid hold-up pool vessel includes steam input and wherein steam is recycled therefrom to said bottoms liquid removal area of said fractionation vessel to provide a seal between product vapors and bottoms liquid.

16. The process of claim 13 wherein said bottoms liquid removal area of said fractionation vessel includes a quenching liquid outlet contained therein which extends from said bottoms liquid hold-up pool vessel.

17. The process of claim 15 wherein said bottoms liquid removal area includes a steam

distributor to inhibit product vapors from contacting bottoms liquid being cooled.

18. The process of claim 16 wherein said bottoms liquid hold-up pool vessel includes a purge outlet and a pumparound outlet through which colder liquid removed from said vessel is purged and is pumped around for fractionation.

19. The process of claim 13 wherein said process is selected from the group consisting of petroleum fractionation, petro-chemical fractionation and chemical fractionation.